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Philosophy: A Crucial Distinction.
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The objectives of the Early Childhood Center at Drexel Institute of Technology are to provide an observation laboratory for students, conduct research in huma n behavior and development, supplement the child's home environment, and provide learning experiences for parents. Children at the center are from 2 years 7 months to 4 years 9 months in age. To ensure parental involvement, all parents are required to be directly involved at the center for 35 hours a year. Teaching machines are used to train children in skills and concepts, which leaves the teacher free to concentrate on the development of new concepts and creativity. An Edison Responsive Environment (ERE) is used for research and demonstration purposes. The ERE provides audio-visual-tactile responses to the students' actions. The machine is programmed to progress from an introductory to a written, visual, and oral question-and-answer phase. The Center's laboratory also contains non-automated equipment. Detailed records are kept on the children's progress. Each child is tested before and after the year's program for physical, emotional, intellectual, and linguistic achievements. When tested for alphabet recognition, typing ability, size of sight vocabulary, and language facility, children showed significant gains in these primary reading skills, except for language facility. (DR)

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Philosophy:
A Crucial Distinction

There is a clear distinction between learning as a training process and learning as new concept formation. Training involves the learning of some specific pattern of behavior, be it equilibrium on a tight rope or chess playing. Education involves the development of new, not previously learned behavior. Education should lead to accomplishment beyond the learned pattern. The result of education is creativity while the result of training is performance involving skill, and not necessarily creativity. By definition, education is not taught but achieved. However, a skillful teacher so sets the situation as to make education not only possible but likely.

The use of technology in training is just beginning to develop as a force in education. Teaching up-to-date has rested on direct communication between people. This is but one possible dimension in people-to-people relations which has been offered in education. The machine offers the opportunity of another dimension. As a result, the field of teaching systems is just that much enlarged.

Technology can be used in the acquisition of skills or concepts. Curricular materials, as well as instructional techniques, are tailored to the individual. Attention is paid to the psychological as well as the logical structure of substantive subject matter. (Person-Object) relation is as essential as (Person-Person) relation. People to pelple relations work best when they share similar experiences. People to people contact is basically inhibited by different educational backgrounds inhibited by the fact that people have not had similar past experiences. However, if both had people-object relationships and share some experiences then education (people-to-people relation) becomes easier to achieve.

The teacher who trains, and the teaching machine, have as their function the teaching of skills or concepts. The differences is that the machine can function immeasurably more effeciently in the repetitive teaching which develops skills. In using technology for training purposes, the teacher is then free to concentrate on education.

I. Education at the Early Childhood Center

Since education is not taught but achieved, the task of the Early Childhood Center is to provide a matrix which enhances thinking, continuous learning and fruitful involvement of the individual.

Thinking is the analysis of doubts. Material is thus presented in such a way that the child is made aware of uncertainties in the environment. Questions abound and time and guidance are given to allow the individual to realize his own potential for thinking.

Thinking without knowledge is sterile; knowing without thinking is fruitless. With the acquisition of knowledge which the individual is able to acquire in the training center, thinking and knowledge can form a fruitful interplay leading to continuous learning and involving new concept formation.

II. Training at the Early Childhood Center

Situated within the confines of the Early Childhood Center is a training center using educational technology for research and demonstration. An Edison Responsive Environment machine forms the mainstay of the automated center, and Instructo materials are at the core of the non-automated center. Research is being developed in four areas:

- learning in the sense of acquisition of skills and information, reading, writing, arithmetic, etc.
- design of curriculum materials along cybernetic lines
- development of instructional methods and materials
- evaluation of the program

II. Operating Procedure at the Early Childhood Center

A. Admission

An application blank must be filled out for each child. The order of acceptance depends on the needs of the nursery school group. Whenever a vacancy occurs, it will be filled with a child of the age and sex suited to the group's needs. The date of application for entrance will determine the order of contacting parents on the waiting list whose children meet these requirements. Applications are accepted on a yearly basis only, unless a vacancy should occur during the year. Children are covered by group insurance against accidents occuring at the nursery school.

A group of twenty children from the Get-Set program is integrated with twenty tuition-paying children. Exceptional children, both mentally and physically exceptional, are admitted if the Staff considers that the child can be helped in this center.

B. Program

The programs are flexible, but the schedules below are indicative of the program of each group:

Morning Group -- Three Year Olds

8:30 - 9:15	Health Inspection
9:00 - 9:45	Free play Indoors or Outdoors
9:45 - 10:00	Bathroom Routines
10:00 - 10:15	Fruit Juice
10:15 - 10:45	Creative Work and/or Free Play
10:45 - 11:00	Bathroom Routines
11:00 - 11:15	Music and Stories
11:15 - 11:30	Rest
11:30 - 12:00	Lunch

Afternoon Group -- Four Year Olds

12:00 - 12:15	Health Inspection
12:00 - 12:15	Free Play Indoors
12:15 - 12:45	Lunch
12:45 - 1:15	Rest
1:15 - 1:45	Experiences in Science, Social Studies, Health, Safety, Art, etc.; Free Play and/or Creative work.
1:45 - 2:00	Cleanup, Bathroom, Locker
2:00 - 2:35	Lockers, Bathroom
2:45 - 3:00	Snack
3:00 - 3:25	Experiences in Science, Social Studies, Health, Safely, Art, etc.; Free Play and/or creative work.
3:25 - 3:50	Music
3:50 - 4:00	Lockers

Through out the day, all children have the option of going to the training center for 15 to 20 minutes.

III. (cont.)

C. Transportation

Transportation must be provided by the parents. A child enrolled in the school is expected to attend regularly from Monday through Friday unless he is ill. Regular attendance is important for the child's development and for the college students studying the children. Children are expected to arrive on time and to leave on time. Each mother or father is expected to come to the nursery school at least twice a week, even if the child travels to school in a "car pool" arrangement.

D. Adjustment to School

Not more than two to three new children start on the same day and admission is a gradual process. If a child has had a satisfactory experience being away from the parents, the mother may be able to leave after the first day. However, how long she needs to stay depends upon how secure the child feels in the new situation.

E. Fees

The fee for one year is $290. In addition there is a registration fee of $10.00.

F. Health Policies

Each child before entering school must have the necessary immunizations. A certificate of vaccination is to be filed with the director upon entrance. The children are received and inspected by the director at each opening session. Children with colds, skin eruptions or other symptoms of illness will be sent home, and for this reason the parents must wait until the child has been checked.

The director is to be notified immediately if a child has been exposed to any communicable diseases.

G. Comparable Centers

A center with a partially similar training program using ERE is located at Hamden, Connecticut. However, the ratio of non-automated to automated programs is 5:1 while at Drexel we are aiming to a 1:5 (i.e.one non-automated to automated sessions.) Lack of equipment makes this at present difficult to do for all children. We are now using a 1:1 ration (i.e. 1 automated to 1 non-automated session.)

IV. The Training Center

A. Physical Description

The training laboratory of the school consists of a room with an Edison Responsive Environment machine, and a room with non-automated equipment. They are located in two rooms, back to back, and separated from the rest of the school by a corridor. Windows in the ERE room are opaque; walls bare. Air conditioning maintains a temperature of about 72°.

. The Automated Equipment

Essentially a computerized typewriter with large type, the Edison Responsive Environment instrument contains audio components, slide viewer, an exhibitor (on which typed or printed words appeared), and a magnetic tape recording device. These devices are united in operation by a compact, special-purpose computer which provides almost instantaneous sensory responses (audio, visual, tactile) to the students' actions. These components in combination with a simple programming system, are housed in a soundproof, air-conditioned booth, thus creating the conditions for a "responsive environment."

. The Non-Automated Equipment

In the non-automated "booth" there is a Remington electric typewriter with primer type, blackboard, tape recorder and a opaque projector. The child sits before the typewriter and next to the blackblard. The booth assistant is at his side.

This "booth" is operated in the same manner as the automated one, but without the automatic responses. Acting as a substitute for the audio automaticity of the ERE, the booth assistant provides oral responses. A viewer is used for presentation of the visual material, letters, words, and sentences, which the child will either type or read. This viewer is controlled by a push button device which enable the child to advance the film at his own rate of speed. The tape recorder can be used to record the child's own stories, to read what he has typed, or it can be pre-"programmed" to give the child operational instructions.

The non-automated equipment is used to enhance and supplement the ERE program. Its use with the ERE allows additional flexibility for adaption to a child's more apparent desires.

. Additional Materials

Software items are incorporated into the training programs as well as Instructo Materials, film strips, photographs, and stories from a literary magazine written by the children. Other materials are used to provide additional flexibility for learning.

B. Procedure

. Population

The number of children admitted is limited to twenty (3 year old) in the morning (8:30 am to 12 noon), and twenty (4 year old) in the afternoon (12 noon to 3:30). They range in age from approximately two years and seven months to four years and nine months.

A group of twenty children from the Get-Set program are integrated with twenty tuition-paying children.

Exceptional children are accepted if the staff deems that this center can be helpful in transcending the limitations imposed by the exceptionality, be it mental or physical.

. The Child and the ERE

A child's acquaintance with the ERE begins as soon as he enters the Early Childhood Center. A teacher or another child who has had previous experience on the ERE helps the child become familiar with the equipment.

Verbal or other contact between the booth assistant and the child is kept at a minimum. The child is informed that it is his turn to go the machine, ideally by the returning child. He has the option of accepting or rejecting the offer. Upon enterning the machine, he is helped into an elevated chair by the assistant. The assistant leaves the booth and operates the machine from the control panel, and is able to observe the child through a one-way mirror located just below the control panel.

During these daily sessions, the child sees no one in the training center except the booth assistant. Training involves the child with all the staff at this center so that a daily record is kept of the child's performance, stroke count on the equipment, time spent, etc., and weekly discussions reviews progress made.

The machine can be programmed in four phases. The phase of operation is dependent upon the progress of the child.

Phase I

In this phase, the equipment can be used as a conventional electric typewriter. This phase does not involve the child directly. Rather it was designed for the programming of the machine.

Phase II (Introductory and Exploratory)

During the first session with the machine, the child is confronted with what appears to be a typewriter with colored keys. The child can explore the keyboard freely. Upon the depression of a key, the sound of the character is pronounced, and its symbol is typed. Each depression locks the keyboard until after the pronunciation. In later sessions, flash cards of individual letters may be presented for the child to match with the letters on the keyboard. The child remains in this phase until it appears that he is able to relate the sound to the written word.

Phase III

This transitional phase was developed at this center. When the child is able to match some letters and recognized them by name, he may be shifted to this phase. The booth assistant controls the activity from the control panel. He may pronounce a letter over the intercom and lock the keyboard until it appears that the child is going to depress that letter. He may then release the keyboard, or repeat it using different cues, such as color. For a child who is not yet capable of performing the task called for by the Phase III but able to match some letters and sounds, this flexible method is excellent as an intermediary stage.

Phase IV (Word Concept and Recognition, Syntactical Structure)

When a child reaches this stage, he has become familiar with the alphabet and/or numbers. It is at this stage that he learns that letters form words and that he becomes familiar with the typing of the syntactical structure of the language. The child types from instructions provided in the program or by a booth assistant. The machine locks itself so that nothing except the letters or numbers that are indicated by the verbal command of the card can be typed.

Phase V

In this phase, the machine is programmed so that it can read a sentence, a paragraph or tell a story before or after a child types, while at the same time, it can continue to respond to individual characters and words. Hence, it can deal with reference to the earlier learning sequences.

Questions can be programmed pertaining to what is written or visually exhibited. The child can then answer either orally or with a written reply on the recording-reproducing unit.

- Evaluation

Children are tested shortly after they enter the Early Childhood Center. Testing is done to gauge physical, emotional, intellectual, and linguistic achievements. At the end of the year tests are repeated and evaluated.

Evaluation by staff members proceeds at many levels:

- Through observations and detailed records by all staff members

- The booth assistant monitors each session and records the results on an evaluation sheet.

- Weekly staff meetings enable the staff to discuss the child's progress.

- Some 200 students in Human Behavior and Development course work are involved in longitudinal case studies each term. Each child at the center is thus observed by at least two students.

- As preparatory course for early childhood education and home economics education, some seventy students have even more in depth involvement by being assistants to the teacher and assistant teachers two hours a week throughout the school year. These students also add to the evaluation.

- About twenty student teachers participate on alternate weeks at the staff meeting and contribute as well as teach.

- A staff of consultants, the director of the Learning Disabilities Center in Philadelphia, psychiatrists, experts in the fields of bio-medical engineering, computers and sex education, visiting lecturers in varies fields such as linguistics and anthropology, form a strong bridge from practice to theory and back to practice.

V. Involvement of Parents

A. Parent and Child

Parental interest may provide an incentive for learning. During a child's participation in the training program, subtle indications of the new concepts and skills he is acquiring may be given. He may begin to name letters on a box of cereal, spell the letters of a "STOP" sign, or want to know how to say a word in a book. Acknowledgements of such instances by the parents will reinforce the pleasure of the learning experience.

Parents can also contribute by making learning materials available to the child. Many useful items can be acquired. Magnetic or felt letters, chalk boards, crayons, magic markers and books, are items that are available commercially or at the center for the use of the parents. Used in a relaxed atmosphere, the provision of these items may help the child to come to regard learning as a valuable daily experience. While such an environment appears to lead to the use of learning as an ornament, it may soon lead to learning for the sheer joy of learning.

B. Parent and School

Communication between parents and teachers is a necessity. Parent-teacher conferences are scheduled at regular intervals during the school year, PTA meetings are held bi-monthly for the mutual education of parents and teachers.

All parents are required to be directly involved at the ECC for 35 hours a year. The continued enrollment of the child is dependent upon this requirement being fulfilled. Parents are also invited to visit the Early Childhood Center at any time to observe their children. It is requested that such visits be preceded by prior arrangements with Mrs. Baker, director of the Early Childhood Center.

VI. Some Results of the Training Program

A. All children were pre-tested on the following variables:

- Alphabet recognition for both upper and lower case letters
- Ability to type words
- Size of sight vocabulary

At the end of five months, these skills were reassessed and the results were compared to earlier testing. In the case of alphabet recognition, a comparison of pre- and post-test scores were made. Since none of the children could initially type or read, only post-test data are reported for these two variables.

The following category system was devised for classification of the data.

ALPHABET RECOGNITION

Level	Performance
1	none
2	some upper case
3	all upper case
4	some upper and lower case
5	all upper and lower case

TYPING

1	none
2	types name
3	types names and short words
4	types from dicatation

SIGHT VOCABULARY

1	none
2	name
3	1 - 9 words
4	10 - 25 words

To gauge lanuage facility, the Dailey Language Facility Test (3) was used. This instrument is a three picture test, administered individually, designed to measure facility in the use of oral language independent of vocabulary and specific information. The correct identification of objects in the pictures in not rated. Scores are based upon elaboration of response, i.e. a one word response receives a score of 1 while a creative story is scored at 9. The highest score obtainable, then, is 27. In a previous study, reliability was .75 using three scorers. Data utilized in this study were collected from the 12 children who were present on both pre- and post-testing dates. The means were compared by a test.

B. Findings

Alphabet recognition

At the time of the pre-test, the median performance fell within Level 2. This would indicate that the group had the ability to recognize some, but not all, upper case letters, and no lower case letters. At the time of the post-test, the median performance was within Level 4. Recognition of all upper case letters had by then been acquired in addition to some, but not all, lower case letters.

Typing

At the end of the five month period, the median performance for the entire group was within Level 2. This indicates that the children could type their names, but not other words.

Sight Vocabulary

Data on this variable revealed that the median level after the experimental period fell within Level 2. At this stage, children could recognize their names but not other words.

Language Facility

With regard to this variable, the difference between the means of pre- and post-test were found to be nonsignificant. (t = 1.10)

No differences were found between the performance of tuition and non-tuition children on any of the variables, nor were any differences found between boys and girls.

C. Discussion

The findings of this study corroborate those of Moore (1967) in that children did acquire primary reading skills through the sue of the Edison Responsive Environment. The non-tuition children and the tuition children showed similar learning rates. This finding was unexpected in that performance on IQ tests showed a 17 point discrepancy in favor of the tuition group.

Until recently, the transmission of specific skills related to our culture was contingent upon an instructor (parent or teacher) and/or materials. With the advent of the teaching machine, the learner can now be independent of the instructor. He becomes actively involved, gets immediate feedback about his actions, and progresses at his own pace. This process is carried on in a setting in which a person to person interaction is not essential.

While the effectiveness of teaching machines has not yet to be fully determined, this means of instruction would appear to be well suited to the young child who may possess a short attention span and an affinity for manipulating the environment.

Controlled research is needed to account for possibilities of Hawthorne Effect and maturation, and follow up is necessary to gauge long term gains. However, effects of early instruction have shown that children can and do learn in what were formerly called the "pre-school" years.

VII. Visitors, Please Observe

Due to the intimate and individual nature of the program, visitors are asked to cooperate with the following procedures.

- Enter the room quietly and stand behind the booth. The one-way mirror and earphones allow one to both see and hear the child.

- Please maintain silence. The booth is not completely soundproof and noise may distract the child.

- Visitors will be allowed to examine the machine after the completion of the session. During this period, the operator will answer.

- Sessions can be discussed with the staff, but should not be discussed with the child.

- While observing the non-automated area, it is necessary to look through a small opening in the door. We apologize for this inconvenience but there is not other adequate observation area available at present.

VIII. Staff

Mrs. L. Baker	Director, Early Childhood Center
Mr. J. Flor	Supervisor, Training Center
Mrs. K. Abrahams	Graduate Teaching Assistant
Mrs. M. Moskovic	Teaching Assistant, Programmer
Miss E. Schlein	Programmer and Monitor
Miss F. Bailey	Programmer and Monitor
Mr. E. Cushanick	Programmer and Monitor
Miss M. Zeiger	Programmer and Monitor
Miss R. Krepol	Programmer and Monitor
Miss J. Nordquist	Programmer and Monitor
Mrs. A. Myers	Teacher Aide
Mrs. T. Smart	Teacher Aide
Mrs. E. Scott	Housekeeper - Cook
Mrs. M. Edwards	Housekeeper - Cook
Miss C. Rickson	Housekeeper - Cook (Part Time)

In cooperation with and under the direction of the Department of Human Behavior and Development:

Dr. D. R. Steg	Chairman, Department H B & D
Dr. C. Silver	Assoc. Prof. of Behavioral Sciences
Dr. A. D'Annunzio	Associate Professor
Dr. S. Taubin	Assistant Professor
Dr. M. Kane	Lecturer
Mrs. L. Baker	Instructor
Mr. E. Falk	Instructor
Mrs. L. Pearson	Director Student Teaching
Mrs. H. Zearley	Director, Home Management House
Miss C. Fox	Graduate Assistant

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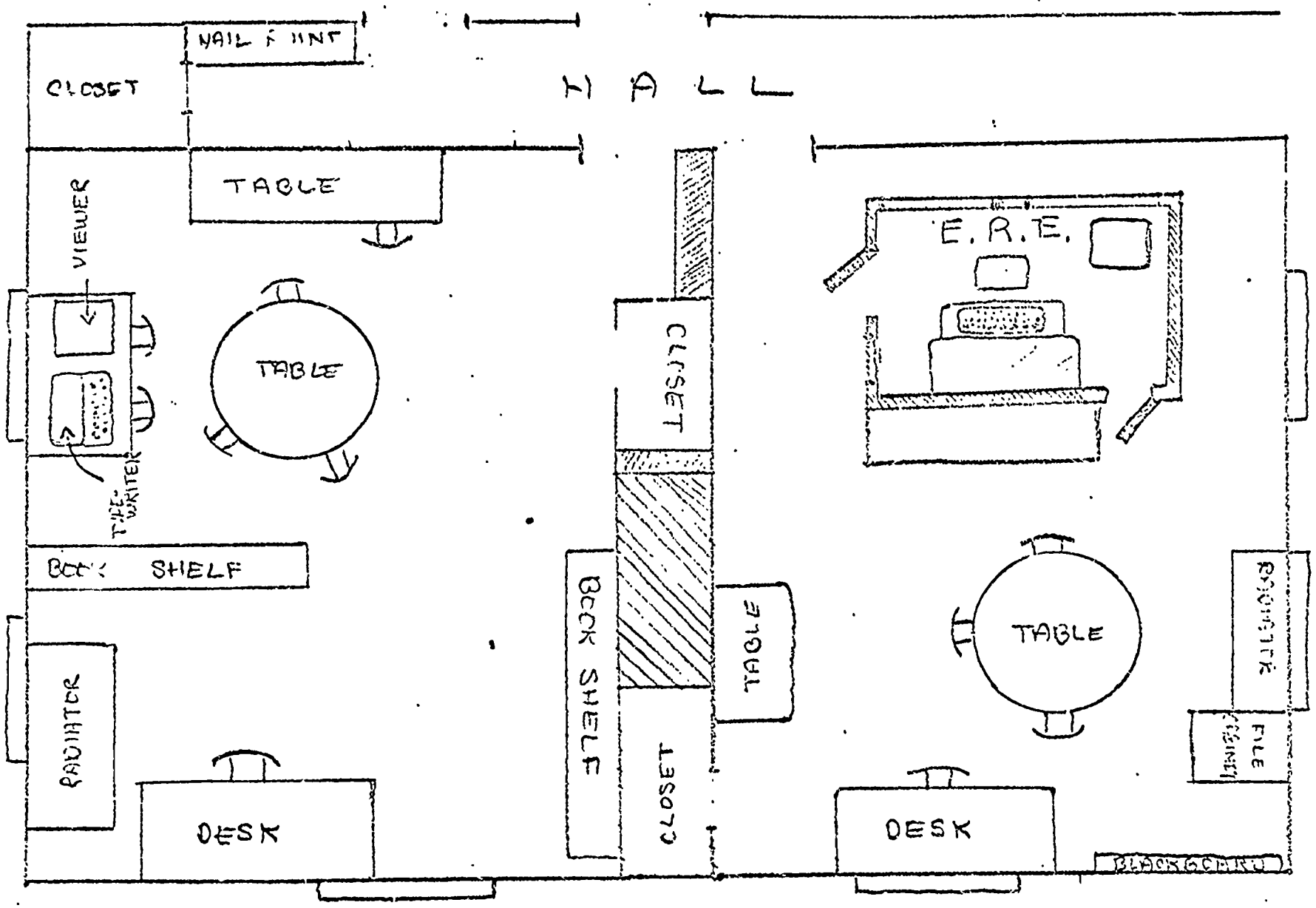
E.R.E. TRAINING CENTER



Scale:
1/4" = 1 foot

MAIN ENTRANCE

MUSIC ROOM

PLAYROOM

HALL

MAIN PLAYROOM

STORAGE

HALL

FOYER

OBSERVATION BOOTH

LIVING ROOM

TO BASEMENT

TO CHILDREN

CLOSET

BATHROOM

KITCHEN

BATH Room

NON-AUDITORY

ERE

DRIVEWAY

PLAY AREA

PLAY AREA

THE EARLY CHILDHOOD CENTER

Department of Human Behavior and Development
College of Home Economics
Drexel Institute of Technology

The Early Childhood Center is under the direction of the Department of Human Behavior and Development. It functions as an active center for Study and Research in Human Behavior and Development, particularly for CHILD STUDY, RESEARCH, and DEMONSTRATION of practices in early childhood education, and for the TRAINING of teachers in nursery school education and home economics.

Its objectives are as follows:

- To provide a laboratory in which students of Human Behavior and Development, and Education in the College of Home Economics may observe study, and be involved with children under trained supervision.

- To conduct Research in Human Behavior and Development.

- To supplement the home through providing an environment which will enhance the child's physical, social, emotional and intellectual development under the guidance of a qualified staff.

- To permit parents to learn through observation and participation in the school program, through conferences, and through group meetings of parents and staff.